REMARKS

This communication is in response to an Office Action mailed 5 November 2007. A previous Office Action required Applicants to elect another single disclosed species for prosecution on the merits under 35 U.S.C. 121. In the response entered by the Office on February 23, 2007, Applicants elected the species of major histocompatibility (MHC) proteins as a final species of dopant molecules.

Claims 7-20, 25 and 26 are currently pending. Claims 7, 8 and 14 have been objected to; Claims 7-20, 25 and 26 are rejected. Claims 1-6 and 21-24 have been cancelled. Claims 7, 8, 9, 13 , 14, and 25 are currently amended. Claim 27 is new and supported by the claims. Support for the claim amendments can be found at pages 4-5, 10, and 15-18.

Summary of the Interview

Applicants' attorney, Michelle S. Chew (Reg # 50,456) and Examiner Mark Shibuya conducted a telephonic interview on January 10, 2008. During the interview, the reference Dori et al. and proposed claim amendments were discussed. The proposed claim amendments would have resulted in a new search being required and would not have overcome Examiner's rejections based on the prior art. Examiner suggested that an RCE be filed if those amendments were pursued. Applicants submit an RCE but with claim amendments which Applicants believe do not require a new search and are supported by the specification.

Response to Office Action

Applicants thank the Examiner for the withdrawal of the previous written description and indefiniteness rejections of the claims.

Applicants note the new rejections recited in the Office Action mailed 5 November 2007 and respond to each in turn. For the sake of clarity, the rejections and objections of the presently outstanding Office Action are set forth below, in the order in which they were presented and are herein addressed:

1. Claims 7-20, 25, and 26 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter allegedly not supported by written description.
2. Claims 14-20, 25, and 26 stand rejected under 35 U.S.C. 112, first paragraph, as indefinite.
3. Claims 7, 8, 10, 11, and 14-18 stand rejected under 35 U.S.C. 102(b) as being anticipated by Dori et al, *Biomedical Materials Research*, Sept 7, 1999, p. 75-81.

I. The claims are supported by written description in the specification.

The Office Action rejects the claims as containing matter not supported by the specification, specifically the Office Action alleges that "[t]he specification as filed does not appear to provide support for methods comprising cell interaction that is a "functional cell-cell interaction", as in independent claims 7, 8, and 14. Without conceding to the rejection, and solely for the purpose of furthering Applicants' patent goals, Applicants have amended the claims thus rendering this rejection moot in regards to the term "functional cell-cell interaction."

The Office Action further rejects the claims as not supported by the specification "for methods comprising "lipid bilayer membranes which *mimic* an artificial cell surface." Office Action, page 4. Without conceding to the rejection, and solely for the purpose of furthering Applicants' patent goals, Applicants have amended the claims thus rendering this rejection moot in regards to the term "lipid bilayer membranes which mimic an artificial cell surface."

The Examiner in the Office action, submitted that the example describing "lymphocyte-endothelial interactions, wherein endothelial cell membranes are held in corrals... does not involve the use of dopants, and so is not relevant to and does not constitute support for the claims as amended." Office action at 5. In response, Applicants respectfully point the Office to

paragraph [0023], wherein the specification describes that "The dopant may also be or include proteins that modulate cell adhesion. The fluid nature of the lipid bilayer of the present invention allows various membrane-bound proteins to be included in the bilayer while retaining their biological activity, including the ability to cluster and move about within the lipid bilayer artificial membrane." Furthermore, in paragraphs [0024] to [0029] describe the use of proteins as dopants. Applicants are entitled to define terms n the specification and have defined the term "dopant" to include lipids and proteins. Thus, the specification describes as claimed in claims 7, 8, and 14, the use of membrane proteins and membrane-associated proteins as dopants that retain their biological activity and direct cell adhesion.

Furthermore, the specification on page 9, provides in paragraph [0041] that "[T]hese membranes are designed to include dopants that modulate cell adhesion and growth characteristics. These dopants may be proteins used to provide an effective artificial cell surface, such as T-lymphocytes or neutrophils. The artificial cell surface may then be tested for cell adhesion properties and/or growth properties with a variety of test cells in culture. Numerous different cell surface properties may be modeled in a single micro-array." And in paragraph [0029], a sample study of the activation of cytotoxic T lymphocytes (CTL) using a major histocompatability complex protein-doped membrane to mimic antigen presenting cells is described. Thus there is adequate support for the use of proteins as dopants in the claimed methods.

In light of the amendments and the support in the specification pointed to above, Applicants request that the rejection be withdrawn and the claims allowed.

II. The claims are definite.

The Office Action rejects the claims under 35 U.S.C. 112, second paragraph as being indefinite because of the phrase, "which mimic an artificial surface." Office Action at 6. Without conceding to the rejection, and solely for the purpose of furthering Applicants' patent goals, Applicants have amended the claims thus rendering this rejection moot in regards to the phrase "which mimic an artificial surface." Applicants request that this rejection be withdrawn.

III. The claims are not anticipated by Dori et al.

Claims 7, 8, 10, 11, and 14-18 stand "rejected under 35 U.S.C. 102(b) as being anticipated by Dori et a;., Biomedical Materials Research, Sept 7, 1999, p.75-81. The Office Action alleges that Dori et al. "teaches cell adhesion to lipid bilayer membranes…said bilayers on mica supports are then placed in a plurality of submerged glass vials, which read on microarrays."

For a claim to be rejected under 35 U.S.C. 102(b) as being anticipated, each element and limitation must be taught. Referring now to the amended claims 7, 8 and 14, Applicants assert that Dori et al fails to teach each and every claimed limitation of the claims, specifically the limitation that *the dopants direct cell adhesion* and the limitation that "the dopants are selected from the group consisting of charged lipids and membrane proteins, wherein said membrane proteins are selected from the group consisting of ICAM, N-CAM, C-CAM, major histocompatibility complex (MHC) proteins, and MHC peptides."

Applicants resubmit that Dori et al. does not teach or suggest this claimed limitation. Dori et al used "the accessibility of a ligand … as a means to influence the cell behavior. Supported bioactive bilayer membranes were created by Langmuir–Blodgett (LB) deposition of either a pure poly(ethylene glycol) (PEG) lipid, having PEG head groups of various lengths, or 50 mol % binary mixtures of a PEG lipid and a novel collagen-like peptide amphiphile on a hydrophobic surface…Cell adhesion and spreading assays showed that the cell response to the membranes depends on the length difference between head groups of the membrane components. Cells adhere and spread on mixtures of the peptide amphiphile with the PEG lipids having PEG chains of 120 and 750 molecular weight (MW)." Dori et al., abstract, p.75, emphasis added. As stated in Dori et al., "In this study we used a specific system with a unique peptide ligand, but we believe that the results of this study will be applicable to other systems and will help in the design of bioactive membranes in which selective masking of a ligand on a surface will be used as a means to control the response of cells." Dori et al, p.81, emphasis added.

In contrast, Applicants claimed method uses doping to direct or promote cell adhesion as opposed to masking to prevent cell adhesion. The membranes in Applicants' claimed method are freely accessible and mimic a cell's natural surface. The membrane surfaces in Dori et al, do not

mimic natural lipid bilayers and require PEG lipids and peptide ligands bonded to the lipid head groups to control cell response. Thus, Dori can be seen as teaching away from Applicants' claimed method because directing cell adhesion is in opposition to teaching of Dori of masking and prohibiting cell adhesion.

Furthermore, Dori et al. does not teach the use of a single "substrate comprising an array of adjacent membrane corrals." Applicants submit that the Office has misinterpreted Dori as teaching micropatterned surfaces. Dori teaches the use of mica supports in a plurality of submerged glass vials, and appears to test each amphiphile on a different support in separate vials. Note the images shown in Figures 4 of Dori et al. show only separate photomicrographs of cells on each different surface, not adjacent membrane corrals.

In contrast, Figure 3B of Applicants' specification, shows a photomicrograph of a solid substrate having adjacent membrane corrals, wherein the method of the present claims has been carried out. Notice that cell adhesion in Figure 3B is directed by the doped membrane and cells are observed in the top corrals of the microarray but devoid from the bottom two corrals. Also, as described in paragraph [0086] of the specification, cells were grown to confluence on the doped membranes but the undoped membrane remained devoid of cells. Thus, Applicants submit that Dori et al. does not teach or suggest Applicants' claimed invention. Therefore, because Dori et al. does not anticipate and teaches away from the claimed invention, the rejection of claims 7, 8, 10, 11, and 14-18 should be properly withdrawn.

CONCLUSION

Accordingly, Applicants respectfully request prosecution of the pending claims in due course. A Request for Continued Examination and the accompanying fee of $405.00 is included herewith. A petition for an extension of time for one month is enclosed with the fee of $525. Applicants believe all fees necessary for this amendment are submitted herewith. If any additional fee is necessary for entry of this amendment, then Office is hereby authorized to deduct that charge from Deposit Account 120690. If a telephone conference would, in any way, expedite prosecution of this matter, the Examiner is encouraged to contact the undersigned at (510) 495-2456.

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Respectfully submitted,

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